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## Program Logic For Displaying Text Passages On A Screen

The present invention concerns a programme logic for displaying text passages which are relevant for the solution of a task on a screen by using at least one data memory for text passages which are electronically stored; upon entering a combination of search criteria the text

5      passages relevant to such combination will be displayed on the screen.

Carrying out of searches for text passages by using at least one data memory is well-known. For that purpose search criteria, in particular search words, are entered into the data memory, whereupon the text passages relevant to such criteria will be displayed on a screen. However, the known processes for the carrying out of searches for text passages have the

10     disadvantage that it cannot be seen on the screen what relevance the text passages displayed have with respect to the search criteria. This applies, in particular, if searches are made with respect to a combination of search criteria.

The article by Fowler et al entitled "Integrating Query, Thesaurus and

15     Document Through a Common Visual Representation"; proceedings of the Annual International ACM/SIGIR Conference on Research & Development in Information Retrieval, Chicago, October 13-16 1991, No. Conf. 14-30 October 1991, pages 142-151 discloses the use of visually displayed graphic structures and a direct manipulation interface for use in document retrieval. A visually displayed network

20     structure is used and a natural language query is converted into a visually displayed network structure, the manipulation of the network structure then allowing manipulation of the query.

The article by Hemmje et al entitled "Lyber World - A Visualisation User Interface Supporting Full Text Retrieval", SIGIR 1994, Dublin, July 3-6 1994, No.

25     Conf. 17, 3 July 1994, pages 249 to 259 discloses a graphical user interface for use in an information retrieval system in which text passages are displayed on a screen in relation to set criteria with radial distances between the two indicating the degree of relevance. The search criteria are placed around the circumference of the display area, with the text passages being arranged inside the display area.

The article by Lamping et al entitled "A Focus and Context Technique based on hyperbolic geometry for visualising large hierarchies"; Human Factors in computing systems, CHL 1995 conference proceedings, Denver, May 7-11 1995,

5 pages 401-408 discloses a method of displaying a hierarchy in a circular display region with its root at the centre, and branches extending out from the centre, those branches then branching further toward the circumference of the circle.

The article by G G Robertson et al entitled "Cone Trees: Animated 3-D Visualisations of Hierarchical Information", Human Factors in Computing Systems

10 conference proceedings, Reading, USA, 27 April 1991, pages 189-194 discloses a similar visual display known as a cone tree, but in three dimensions.

The present invention is based on the task of creating an improved method through which in case of a search by means of a combination of search criteria the text passages found thereby are displayed on the screen in such a way that their relevance in relation to the individual

15 search criteria is shown. According to this invention, this objective is achieved by concentrically arranging the text passages on the screen around the combination of the search criteria, with the radial distances of the individual text passages showing their relevance in respect of the search criteria.

Preferably the individual search criteria are attributed to sectors on the screen, with the

20 individual text passages being shown on the screen in the sectors of that search criterion for which they are most relevant. A radial beam or a radial level, respectively, can lead from each of the search criteria shown in the centre, with the text passages relevant to the individual search criterion being shown in the sectors of the radial beams or levels, respectively, or those text passages which are relevant to two of the search criteria being shown in those sectors which are

25 defined by the beams or levels attributed to such search criteria. In this connection, the display can be two-dimensional or three-dimensional.

Furthermore, the present invention is based on the task of creating a programme logic for obtaining text passages relevant to the solution of a task by using a screen and at least one data memory for electronically stored text passages.

The recording of terms contained in text passages and displaying them on a screen with their relevance to each other being expressed through their arrangement to each other is well known. In particular, this makes it possible to show terms which are subordinate to particular terms of a number of subsequent categories and, subsequently, relevant text passages may be retrieved from a data memory for respective terms, whereupon they are displayed on the screen. This allows you to obtain the text passages relevant to the solution of an existing task. However, this obtaining of text passages is based on the prerequisite that the criteria which are relevant for the solution of a given task are known. If these criteria are not known, it is not possible to find/retrieve the text passages available for that purpose.

Thus, the present invention is also based on the task of creating a programme logic by which the text passages relevant to the solution of an existing task may be found in a very simple manner. The invention solves this task through showing the relevant criteria and the subcriteria attributed to them of several consecutive categories on the screen, whereupon, based on a combination of search criteria, a text search can be carried out in at least one data memory, the result of which can also be displayed on the screen.

Programme logics of the invention are explained in more detail in the following by means of implementation examples shown in the drawing:

chart 1     shows text passages retrieved by means of a search, which are displayed on a screen, with their relevance to several search criteria being expressed/shown;

chart 2     shows terms and subordinate terms displayed on a screen and attributed to a search criterion; and

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chart 3     shows text passages pursuant to chart 1 in combination with terms and subordinate terms pursuant to chart 2.

Chart 1 shows the result of a text search carried out by using three search terms. The query is represented by the letter Q. The search terms are described by the letters B, T and S, each of which lie on a radial beam, with these beams together forming an angle of 120°. The letter Q stands for the term QUERY and the letters B, S and T stand for the terms BENÜTZERPROFILE [USER PROFILES], SERVICEANGEBOT [SERVICE OFFER] and BETÄTIGUNGSFELDER [FIELDS OF ACTIVITY]. The centre Q is surrounded by three centric circles 1, 2 and 3 alongside which the text passages found are shown.

Alongside the most inner circle, 1, those text passages are shown which are relevant in relation to all of the three search terms, B, S and T, so that these text passages meet 100% of the search criteria. In addition, the position of the information close to the beams attributed to the terms B, T or S, respectively, expresses the frequency of the respective search terms in these text passages.

In this chart, alongside circle 1 close to the beam attributed to term B, there are a number of pieces of information, which means that the respective text passages are of particular relevance to search term B. On the other hand, there are several additional pieces of information alongside circle 1 between the beams attributed to terms B and T, and terms T and S, respectively, which shows that these text passages are equivalent with respect to search terms B and T and T and S, respectively. Outside of circle 1 there are circles 2 and 3, alongside which those text passages are shown which are only relevant to two of the search terms, meeting 66% of the search criteria, or which are only relevant to one single search term, meeting 33% of the search criteria, with the position of the piece of information in relation to the beams again showing in respect of which search term or terms these text passages are relevant.

Instead of a two-dimensional display, the display may also be three-dimensional, with the text passages being shown alongside concentric spheres.

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An alternative in showing the results of the text search is to only show references in the first chart and, by means of additional criteria such as shadings and/or colours to express the frequency in which the respective search terms are contained in these references. Subsequently, these references may be retrieved alone and the text passages themselves can be displayed on the screen.

Thus, this programme logic makes it possible to immediately see the frequency of search terms in text passages and/or references and the relevance of such text passages and/or references with respect to several search terms, which makes the retrieval of text passages and the evaluation thereof considerably easier.

In the following, chart 2 explains a programme logic for retrieval of text passages relevant to the solution of a given task. In the centre of the chart the search term Q-QUERY is shown, which refers to the terms RESEARCH, TECHNOLOGY, INNOVATION. The terms B-USER PROFILES, T-FIELDS OF ACTIVITY and S-SERVICE OFFER are attributed to that search term, which terms are displayed on the screen arranged around the search term in beams and in a smaller size. In relation to the term USER PROFILES, these are the subordinate terms RESEARCHER/SCIENTIST, INVESTOR, PRIVATE PERSON and ENTREPRENEUR.. The subordinate terms of the second category are displayed around the respective subordinate term to which they are attributed, again in a smaller size. This beam-wise display of the individual terms attributed to a search term and of the respective subordinate terms attributed to them of several consecutive criteria can be shown on the screen in two dimensions or three dimensions.

For the user of this search programme this display leads to a very clear arrangement of the terms of equal importance or subordinate importance, which makes it easier to select the terms to be used for carrying out the search. Based on the terms the subordinate terms existing in relation to them of several subsequent categories are displayed on the screen.

The subordinate terms attributed to a term or a subordinate term are being retrieved until that subordinate term is displayed on the screen on which the text search is to be based. Subsequently, at least one additional subordinate term will be retrieved based on a different term,

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which subordinate term will also be included in the text search. Thus, at least one term or a combination of terms will be retrieved which may be used for carrying out the text search.

The fact that the programme contains a number of search criteria for a given task which may be of importance for the solution of that task is of importance to this programme. Subordinate search criteria are attributed to such search criteria which, on their part, are supplemented by subordinate search criteria. The user of this programme may retrieve the criteria and/or subcriteria required for the solution of a task. Subsequently, the text passages available for the combination of the relevant criteria may be retrieved and displayed on the screen as has been explained by means of chart 1.

Finally, chart 3 shows the combination of the procedures explained by means of chart 1 and 2. On the one hand, the screen displays the text passages found with respect to the search criteria. On the other hand, additional search terms and search terms subordinate to them are displayed with the aim of supplementing the search by text passages relevant to such additional search terms or evaluating the search by considering these search terms, e.g., in such a way that a part of the text passages will be eliminated.

KEY

CHART 2

| | |
|---|---|
| gründg. ausl. niederlassg. | establishment of a branch abroad |
| unternehmensgründung | foundation of a business enterprise |
| neugründung | foundation of a new enterprise |
| änderung der rechtsform. | change of legal form |
| firmenzusammenlegung | merger |
| ausbildung/schulung | education/training |
| qualitätssicherung | quality control |
| eigeninvestitionen | own investments |
| personal | personnel |
| zukauf (innov.) produkte | purchase of (innovative) products |
| zukauf know how/wissen | purchase of know how/knowledge |
| filialen/in- ausland | branches/domestic, foreign |
| markterschließung | tapping of markets |
| produktionsumstellung | change in production |

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|---|---|
| neue geschäftsbereiche | new fields of business |
| verfahrensverbesserung | improvement of processes |
| produktverbesserung | improvement of products |
| entw. neuer technologien | development of new technologies |
| verfahrensentwicklung | development of processes |
| produktentwicklung | product development |
| versuche/testreihen | tests/test series |
| pilotprojekte | pilot projects |
| studien/konzepte | studies/concepts |
| dissertationen/diplomarbeiten | academic/graduation papers |
| forschungsarbeiten | research |
| veranstaltungen | events |
| publikationen | publications |
| content verwertung | content exploitation |
| einreichung von projekten | filing of projects |
| wettbewerbsteilnahme | (participation in) competition |
| grundlagenforschung | basic research |
| angewandte forschung | applied research |
| beteiligungsmöglichkeiten | investment opportunities |
| investitionen | investments |
| betätigungsfelder | fields of activity |
| software/multimedia | = |
| telekom/info. techn. | telecommunicationsinformation technology |
| umwelttechnik | environmental technology |
| biotechnologie | biotechnology |
| materialwissenschaften | material sciences |
| energietechnik | engergy technology |
| verkehrstechnik | traffic engineering |
| bundländer/europa/intl. | federal government/provinces /Europe/international |
| mit unternehmen | business enterprises |
| zwischen unternehmen | among business enterprises |
| mit forschungseinrichtungen | research institutions |
| zwischen forschungseinrichtungen | among research institutions |
| beteiligungen | investments |
| partner (kooperationen) | partners of (cooperation with) |
| ausbildung | training |

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|---|---|
| serviceangebot | service offer |
| information/beratung | information/consultancy business |
| rechtsberatung | legal counsel |
| förderungsanträge | applications for financial aid |
| förderungsrichtlinien | guidelines for financial aid |
| success stories | = |
| ansprechpartner | contact persons |
| sonderprogramme | special programmes |
| evt. einträge aus ergänzungen | possible entries from supplements |
| zu investoren zu unternehmen | with investors, with business enterprises |
| zu forschungseinrichtungen | with research institutions |
| ansprechpartner in institutionen | contact persons at institutions |
| kontakt | contact |
| finanzierung | financing |
| finanzmittel (privatwirtsch.) | financial means (private economy) |
| venture capital | = |
| darlehen | loans |
| kredit | credit facilities |
| joint venture | = |
| investoren | investors |
| beteiligungen | investments |
| sponsoring | = |
| förderungen | subsidies |
| mezzanindarlehen | "mezzanin" loan |
| seedfinancing | = |
| fördermix | mix of financial aid |
| nicht rückzahlbare zuschüsse | non-repayable subsidies |
| zinsenzuschüsse zu bankkrediten | interest subsidies for bank loans |
| zinsengünstige kredite | loans with favourable interest terms |
| haftungsübernahme | assumption of liability |
| risikoreduktion | reduction of risk |
| unternehmer/n | entrepreneur(s) |
| standort | location |

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|---|---|
| geschlecht | sex |
| industrie/gewerbe/handel | industry/trade |
| stiftungen | foundations/trusts |
| KMU/großbetrieb/einzelunternehmen/ARGE | small and medium-size enterprises/large enterprises/sole proprietorships/work groups |
| tochterunternehmen | subsidiaries |
| konzerne (multinationale) | groups (multinational) |
| benutzerprofile | user profiles |
| privatperson | private person |
| wohnort (nationalität) | residence (nationality) |
| geschlecht | sex |
| weiß nicht/anderes | don't know/others |
| investor | = |
| privatperson | private person |
| universität | university |
| forscher/wissenschaftler | researcher/scientist |
| unternehmen | (at) business enterprises |
| forschungszentrum | research centre |
| erfindungen/patente | inventions/patents |
| beteiligungsmöglichkeiten investitionen | investment opportunities/investments |

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